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COMPUTER DEVELOPMENT AND APPLICATIONS --II

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BCM-III MICROCOMPUTER SYSTEM DEVELOPED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 1

[Article: "Beijing Computer Technology Institute Develops BCM-III Microcomputer System"]

[Text] Based on the use of microcomputers in this country, and utilizing foreign advanced technologies and new types of components, Beijing Computer Technology Research Institute has successfully developed the BCM-III 8-bit microcomputer system bearing the characteristics of machines produced in this country. The system recently passed an evaluation test.

Four of the seven prototype machines developed and assembled by the institute were chosen for technical performance evaluation and reliability test, and the machines worked for 1,296 continuous hours without incident. It is reported that this type of system has already entered the international market.

The BCM-III microcomputer is the improved version of BCM-II. The main improvements are as follows:

--The integration of CRT control with mainframe board, controlled by a single CPU chip;

--Dual sided double density floppy diskettes configured to the system, increasing external storage from 800 KB to 2.4 MB. YD-180-1603 drives are used for the 8" diskettes, and the AC motor is replaced by DC motor, reducing the size by one half;

The CPU is built on a 4 MHz Z80A chip, which is twice as fast as BCM-II's Z80;

The interrupt diskette access mode is replaced by the DMA mode, which is easier to use;

The system is housed in two cabinets and the single-board structure is used, thus greatly reducing the cost;

--A general-use I/O board is added;

--CP/M 2.2 is used as the operating system, and is compatible with CP/M 1.4 of BCM-I and II:

--With the preceding improvements, BCM-III has better performance cost ratio than BCM-II (current price of BCM-III is 39,500 yuan RBM).

A BCM-III microcomputer system consists of a mainframe cabinet (includes one mainframe board and one floppy diskette drive), peripheral interface box (includes one general-use interface board and one floppy diskette drive), keyboard, 24-dot wire printer, and 12 inch CRT display unit. It can be used for scientific calculation, data processing, transaction management, software development, automatic control, and testing.

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THREE SOFTWARE SYSTEMS PASS EVALUATION

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Dec 82 p 1

[Article: "Three Software Systems Developed by Beijing Normal University Pass Evaluation Tests"]

[Text] On 23 and 25 September, Beijing Normal University's Institute of Modernized Educational Techniques evaluated and approved three research and development achievements.

(1) A Chinese character [Kanji] processing system with Chinese characters included in high-level languages (BASIC and COBOL) for CROMEMCO machines.

With this system, Chinese character processing capability is added to the COBOL language of CROMEMCO machines, and the original compiled programs require no modifications at all, which is fairly easy to realized. In BASIC, four language-related functions are enhanced with Chinese character processing capability.

(2) Chinese character supported data base management system written in COBOL.

The DBM system is a fairly universal application package with powerful retrieval functions; it has data base features of a "data base management system" module with extensive adaptability.

(3) Student status/achievement record management system developed in BASIC with Chinese character processing capability designed for universities and colleges.

In logical structure, the system employs an architectural data base organization which can be directly and extensively used in universities and colleges.

The evaluation board members agreed that the development of the Chinese character processing system on the CROMEMCO microcomputer system with only a few modifications in the original software and hardware, plus the enhancement of BASIC and COBOL languages with Chinese character processing

capability through simple, feasible and economical means was a technical and creative accomplishment. The two application systems were also rated as technically advanced achievements worth popularizing. These achievements are new contributions to the development of Chinese character processing microcomputers.

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COMMUNICATION EQUIPMENT INVENTORY CONTROL SYSTEM DEVELOPED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 1

[Article: "Communication Equipment Inventory Control System Successfully Developed by Institute of Electronic Technology Applications"]

[Text] There is a communication equipment management establishment in our country which controls tens of thousands of different kinds of communication equipment, i.e., it purchases communication devices from over 1,000 suppliers, stores them in dozens of storehouses scattered all over the country, and supplies hundreds of users throughout the country. In the past, it used to totally rely on manual methods for drawing up various kinds of plans, which was not only time consuming and inefficient, but also incapable of producing schemes with multiple options; book-keeping and reports were also done manually, which was both time consuming and strenuous. It was impossible then to keep abreast of the overall situation, and it was difficult to perform statistics, analysis and forecasting. To help the establishment overcome the preceding difficulties, the Electronic Technology Applications Institute of the Ministry of Electronics Industry developed a communication equipment computer inventory control system which can gather, process, store and transmit various kinds of up-to-date data on materials and equipment, and their circulation status. The system provides the management people with high-quality and highly-condensed information which is used as scientific basis for decisionmaking and management planning, thus helping to improve the accuracy and speed of their work with reduced management costs and increased economic results.

The communication equipment inventory control system is developed on a minicomputer system. Most of the jobs are run in batch processing mode, and some are processed online. The system employs a quasi-network information management system. The mainframe is configured with 384 KB memory, 4x100 MB disk storage, four tape drives, two local terminals, line printer, and card reader. The storehouses are equipped with intelligent terminals linked to the computer center via communication network switched lines.

The communication equipment computer inventory control system consists of five subsystems which includes four management subsystems, i.e., planning, order entry, inventory and accounting, and an online processing subsystem. The first stage of installment was completed ahead of time. The order

entry, inventory and accounting subsystems were successfully debugged and put on trial run in late May, and the establishment went through a parallel run stage of both manual and computer management systems. At present, the system not only can automatically generate dozens of different types of data reports, but also allows the management people to retrieve and display all kinds of information at any given time. The communication equipment computer inventory control system has already begun to play a useful role.

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EXPERT'S TALK ON DEVELOPMENT OF CHINA'S COMPUTER INDUSTRY

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 3

[Article: "China's Computer Industry Development Discussed by Senior Memory Expert Huang Yuheng"]

[Text] When the National Semiconductor Memory Annual Meeting was held in Suzhou, our reporter availed himself of the opportunity to interview Mr Huang Yuheng [7806 3768 3801], a veteran and leading memory expert in China's computer field. Huang Lao [Elder Huang] is one of the foremost developers of memory devices in our country, and has contributed a great deal to our nation's computer enterprise, especially in the field of memory development. In spite of his frail physical condition due to previous contraction of cancer, Mr Huang is still working conscientiously and perseveringly in the forefront of science and technology to help develop our country's computer enterprise.

Reporter: Hello, Huang Lao! Following the 12th Congress of the Chinese Communist Party, the growth of our national economy will undergo tremendous changes. As a major development project, the computer industry will also step up its pace. In view of the situation, could you tell us about your views on how China should develop its computer industry?

Huang: Over the past 20-odd years, China has managed to develop its computer industry literally from scratch. Now, our computer industry has grown to a preliminary scale, and we have a contingent of technical people who have reached a certain level. But, from the overall point of view, the speed of development is still slow. We are far from meeting the ever-growing demand of the national economy for computer industry, not to mention keeping up with the rapid developments in other countries.

I hope our computer industry can first of all properly handle the relation between popularization and raising of standards. We should first concentrate our efforts on developing and popularizing as soon as possible products which are suitable for extensive applications so as to fully exploit their economic results. The only way to consolidate our industrial foundation and make further improvement is by opening up large markets for massive production.

At present, most organizations tend to go for the so-called "highly sophisticated" products, and look down on the so-called "low-grade" products; the latter, in fact, can play a tremendous role in the national economy, and produce quick turnovers. This tendency should be stopped. Take, for example, microcomputers. In other countries, there is still a large market for 4-bit micros, and 8-bit machines occupy a dominant position; but high speed 16-bit products have not come into extensive use yet. In our country, the development of micros should first of all focus on 8-bit machines, and not lose sight of popularizing 4=bit machines at the same time. On the basis of popularizing these two types of micros, we should then concentrate on 16-bit machines. At present, it is still impractical to concentrate our efforts on 16-bit technology. I think this is something your newspaper ought to keep in mind when carrying out propaganda work.

Reporter: To improve the level of our nation's computer enterprise, we need some funding from the state; but the products of some of our domestic plants are relatively backward, and we have not been able to make the most of available computer equipment in the country. How would you resolve the contradiction between state funding to improve the industrial level and giving full scope to the potential capacities of currently available computers?

Huang: Great care must be exercised in state investments, i.e., we should pay attention to economic results, and not patronize lag=behinders on the subsidization issue. We should gradually reduce the amount of subsidy funds for manufacturers who can produce fairly good quality products but are unable to improve the performance cost of their products; this way, we can still support the manufacturer's production line while forcing the latter to take positive measures toward the improvement of performance cost as quickly as possible. No subsidies should be given to poorly equipped manufacturers whose products are of inferior quality; these manufacturers can either become peripheral plants of the preceding manufacturers and perform auxiliary tasks for the latter, or switch to some other kind of product line.

The utilization ratio of computers in this country is not high at all. This is especially true of many organizations who are spending enormous sums of precious foreign exchanges on importation of complete systems, but due to inadequate technical force or other reasons, the machines are either underutilized or not used at all. On the other hand, there are quite a few organizations who urgently require the use of computers but are not equipped with any at all. It is most distressing to see such lavish wasting. The state should come up with some kind of regulations on computers. Taxation should be levied on imported computer systems or equipment; while tax rates can be lowered for users who make better use of their imported machines, high rates should be imposed on those who make poor use of the machines, thus compelling users with imported computers to make maximum use of their equipment. The tax revenues can be used for subsidizing domestic manufacturers or investments in the computer industry.

Reporter: Today, the technical cadres who have been the mainstay of our computer industry are all in their middle ages now. What should be done to prevent their knowledge from becoming obsolete, and how can we help them continuously improve their technical quality? Also, how can we provide the broad ranks of technical cadres, technical workers, and personnel in other branches of industry with universal computer education?

Huang: This is an issue concerning popularization and raising of standards. If we classify them according to their knowledge level, the high level personnel should improved themselves through advanced courses, and the basic level personnel can get universal education from periodicals. Today, most of the key personnel in the forefront have not received any systematic training for many years; although they have accumulated a great deal of knowledge and experience through their work, their knowledge is not systematic. This is compounded by the rapid growth of computer science and technology, and they sorely need to continuously acquire new knowledge. I therefore suggest organizing specialized advanced training courses in suitable universities and colleges, thus providing them with opportunities to take systematic training courses every few years.

The dissemination of basic knowledge should not be limited to professionals in the industry; computer courses should also be offered in other school disciplines so that graduates of all disciplines will know how to use computers and apply computer techniques directly in their own special fields. In addition, we should also publish popular science periodicals which can explain in simple terms some basic knowledge and new developments in the computer industry, and systematically help the readers improve their computer application abilities. In sum, the universal application of computers must rely on the concerted efforts of technical personnel of all trades, and not just computer professionals.

Reporter: What other points should be stressed?

Huang: Another point which should be emphasized here is that we ought to regard the computer enterprise as an industry to be developed rather than a new kind of technology or science to be studied. After all, there is only room for a few people to be engaged in research work; and the only way for us to materialize the four modernizations is by popularizing computers in all trades and industries. Thus, schools should make appropriate changes in their training direction by offering more computer engineering courses, and less computer science courses.

Besides, we should also strive to improve the distribution of China's contingent of computer personnel. At present, the technical force in factories appear to be weaker than scientific research organizations and schools of higher education. It has gotten to a point where there is a lack of qualified personnel for the development and manufacturing of products, which is highly detrimental to the growth of the computer industry. We should urge scientific research organizations and schools of higher education to provide adequate support to factories. We ought to advocate the policy of three-in-one combination. In addition, from now on,

besides ensuring certain universities and scientific organizations, emphasis should be placed on assigning school graduates to factories. The only way to build a solid foundation for developing the computer enterprise is by reinforcing the technical force in factories.

As this is just a random conversation, what I have said so far may or may not be entirely correct--it's only for your reference. I hope your newspaper will play a useful role in helping our country's computer enterprise develop healthily.

Reporter: Thank you!

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NATIONAL SEMICONDUCTOR MEMORY MEETING

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 3

[Article: "National Annual Meeting on Semiconductor Memory Convened in Suzhou"]

[Text] The Semiconductor Memory Study Group of the China Computer Society held their 1982 annual meeting in mid-September in Suzhou City. Forty-nine papers were presented and exchanged at the meeting, and the participants held discussions on the development work and trend of memory components in our country.

At the meeting, the participants discussed the current status and future development direction of semiconductor memory in this country. They all agreed that the current stage of semiconductor memory development work should be focused on chip testing, engineering assembly, module testing, etc. A wealth of experiences has been accumulated in these areas both at home and abroad; but, due to lack of exchanges, quite a few organizations are following the same tortuous paths. Thus, it was proposed to organize concerned organizations to undertake the task of drafting a set of industrial standards by the end of this year to serve as point of reference for everyone in the field, and thereby promote semiconductor memory development. The participants at the meeting pointed out that in order to speed up the research and development of computer systems, it would be necessary to import limited quantities of components into this country; but the main emphasis should be placed on China's own national industry. Many production lines have already been imported into this country. But now that we are planning to break through memory chip technology, the first thing to do is to develop the most needed memory components: 4 K and 16 K dynamic MOS memory chips, and 4 static MOS memory chips packaged with 16 pins. Research institutes and schools of higher education should be encouraged to promptly turn over their research results to production plants. Research organizations should enhance technical exchanges with production factories and become the latters' technical backup force.

It was decided at the meeting to organize an "Academic Symposium on Information Memory Systems and Engineering, and Reliability" in the second half of next year. Entrusted by the Study Group, Changsha Engineering College will sponsor the meeting, and Xiamen [Amoy] was tentatively chosen as the site of the meeting.

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OLYMPIA 1011 CHINESE WORD PROCESSING SYSTEM

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 4

[Article: "New Chinese Word Processing System Easy To Learn and Use"]

[Text] According to a report in "Asia Computer Monthly," the Sinotype Systems, a joint venture corporation invested by China Technical Import and Export Corporation, China Instruments Industry Administration, Hong Kong Sun Hung Kai Consortium and West Germany's Olympia International, a typewriter manufacturing company, recently organized an exhibition show in Hong Kong to demonstrate its Olympia 1011 Chinese word processing system. The West German Government provided special funding to support the project. The hardware was manufactured in West Germany; the Chinese character software was developed in China.

The system can process 4,096 Chinese characters, including simplified characters and the original complex forms of simplified characters. The basic installation includes three Intel 8085 processors (one is used as CPU, one is used for controlling the printer, and one for generating Chinese characters), 10 KB of RAM memory, and 60 KB of ROM for generating Chinese characters. The machine is configured with 22 inch visual display units, 3 inch microfloppy diskettes drives, and one keyboard. An ink jet printer is employed for output. The advantage of the machine lies in the fact that it is easy to learn and easy to use; a skilled operator can type 120 Chinese characters per minute. But it can only display 6 Chinese characters at a time, which makes editing very difficult. Thus, some people feel that this system will be very hard to market.

With the proper kind of software, the system's Chinese character generator can be used for processing Japanese, French or other languages.

New Coding Method

As Olympia 1011 employs the new coding method invented by Shanghai Instrument Research Institute, it is possible to input Chinese characters by punching in ordinary Latin alphabetical letters. An experienced operator can type in as much as 100 to 120 Chinese characters, which is twice or three times the speed of traditional Chinese typewriters.

The main idea of the coding method is to divide a Chinese character into two, three or four radicals; each radical is coded according to the first letter of its Pinyin romanization. The radical codes are punched into the system in accordance with the rules of Chinese character writing, i.e., in the sequence of top to bottom, left to right.

For example, the Chinese character "lu" [路 6424] is composed of four radicals: "kou" [口 0656], "zhi" [止 2972], "wen" [文 2429] and "kou" [口 0656]. In Pinyin romanization, they are spelled KOU, ZHI, WEN and KOU respectively. Thus, the character should be coded KZWK.

To avoid Chinese characters with homologous codes, if a character is composed of only two or three radicals, the code length should be extended to four letters by referring to the romanization of the last stroke of the character and the romanization of the character itself. For instance, the Chinese character "ming" [名 0682] includes two radicals XI [夕 1119] and KOU [口 0656], which gives the code XK. Thus, it is necessary to extend the code length to four letters, i.e., XKIM. "I" comes from YI [一 0001], and "M" is the first letter of MING, which is the Pinyin romanization of the character itself.

Uses

Olympia 1011 can be used for such word processing work as editing files, correcting typographical errors, and storing files.

It can be also used for user telegraph communication. When the system is configured with a communication card, it can be used as a user telegraph terminal, and directly communicate in Chinese characters or Latin alphabetical letters; the machine should be equipped with a paper tape puncher/reader for sending or receiving messages in Chinese characters or Latin alphabetical letters through a telegraph set up.

Olympia 1011 can be linked to a mainframe as an intelligent terminal for processing Chinese character information.

Olympia 1011 is fairly high priced, i.e., up to $7,500 U.S. currency. According to their plans, the first batch of 5,000 Olympia machines will be manufactured in West Germany, and marketed in Hong Kong and China in the first year. Subsequently, through technology transfer, the model will be produced by Shanghai Instruments Research Institute's subsidiary plant.

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GENERAL-USE STEPPER MOTOR CONTROL SOFTWARE DEVELOPED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 6

[Article: "Shanghai Computer Application Service Center Successfully Develops General-Use Stepper Motor Control Software"]

[Text] A general-use stepper motor control software developed by the Shanghai Computer Application Service Center recently passed a performance evaluation test. As indicated by the test, owing to the use of exponential frequency rise/fall curves, it is possible to effectively prevent the motor from going out of step within a certain range. It allows the variation rate of frequency rise/fall to vary, and can adapt to various kinds of special control and adjustment systems. Besides, the software also has the following features:

It can simultaneously control eight stepper motors with different functions, and has relatively high run frequency; suitable for various kinds of stepper motor work models, and the programs include all the subroutines of step-by-step distribution; provides users with reliable gap compensation measures; can be used as subprogram or interrupt service program in user's system.

At present, the software is programmed in Z-80 instruction codes, but it can be programmed in other codes according to specific requirements.

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SHANGHAI MICROCOMPUTER PERIODICAL TO BE PUBLISHED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 6

[Article: "'Shanghai Microcomputer' Periodical To Be Published"]

[Text] The "Shanghai Weixing Jisuanji" ["Shanghai Microcomputer"] periodical will be jointly published by the Shanghai Group of the Electronic Industry Ministry's microcomputer information network, and the Microcomputer Group of Shanghai Electronics Society. The editorial board consists of eight member organizations, including Shanghai Municipal Committee of Science and Technology, concerned research organizations, universities, and factories. The Shanghai Computer Application Service Center will be in charge of printing and distribution. Preparation work for issues No 1 and 2 are now basically completed, and the broad masses of readers will soon see the periodical. The first issue mainly focuses on three most popular 16-bit microprocessor system in this countri, i.e., 8086, 28000 and M68000; the internal structures, basic functions and typical applications of the three systems will be discussed in detail. The second issue will concentrate on personal computers and the application of 8-bit machines in instrument testing. The periodical falls in the category of computer technical publications, and its primary goal is to help promote the use of computers, and introduce application ideas to both professional people and beginners.

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COMPUTERIZED TRAIN CHART DRAFTING

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 8

[Article: "Computer Used for Drafting Train Charts"]

[Text] Train chart drafting is a branch of system engineering. For some in China, train charts have been charted manually, which is not only strenuous and time consuming, but also prone to such problems as great discrepancies in quality due to difference in levels of various individual draftsmen.

Using predesigned mathematical models and algorithms, the computer employed by the Harbin Railroad Bureau can speedily and accurately arrange freight car routes and instantly produce train graphs on a plotter. It can also print out train schedules and compute the various technical indices of train charts. It is not only faster than the manual method, but is also capable of producing high quality work, and the results are excellent.

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NEWS BRIEFS ON MICROCOMPUTER APPLICATIONS

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 8

[Article: "Collection of News Briefs on Microcomputer Applications (29)"]

[Text] --The Thermal Chemistry Research Division of Xibei [Northwest] University uses a China-made DJS-068-II microcomputer to control a precision heat measurement system. They are using a modified ID algorithm with no D/A conversion; the execute unit is directly driven by the computer which can identify patterns using decisionmaking method, thus constituting a kind of intelligent temperature control system. The system has already run over 1,000 hours; the temperature control can reach a precision level of up to $\pm$ 0.0001 degrees Centigrade, which is the advanced level in China. With the use of microcomputer, the entire system becomes fully automated. Moreover, laboratory results can be processed at no additional costs.

--Nanjing Telecommunication Instruments Plant has developed EE3301 counter composed of MC68000 series chips. The instrument's precision level is 1 nanosecond; its frequency test range is 640 MHz. The monitor program is 1 K and can perform nine kinds of data processing and real time control functions. The user RAM is 4 K.

--Guizhou Engineering College, Fujian Computer Plant and Plant No 359 of Postal and Telecommunications Ministry are jointly developing the FG-II single board postal parcel separation control system for domestic use. The system is composed of a Z80 single board computer with LSI switch I/O channels. As its control mechanism is mainly software, it is possible to greatly increase the number of separation points at low cost.

--Hunan Electronics Bureau and Changsha City Postal Bureau are jointly using a DJS-062A computer to control two 100-slot one-time bagging postal parcel sorters. In the system design, mechanical switching signals are regarded as electric level signals; as its microsecond-level signals are much longer than computer processing signals (nanosecond level), with the addition of an appropriate number of software functions, it is possible to eliminate external interferences by not processing input signals, thus improving reliability and lowering the cost. The programming design employs software interrupt line-up mode (using the separation signal as the peak level). Count processing employs two mutually complementary methods for improving precision, i.e., interrupt entry and recursive.

--The Signal Processing Research and Education Office of Huadong [East China] Engineering College has developed a computer-aided designing software for IIR digital filters on a TRS-80-I machine. The interactive software is written in BASIC II language, and in accordance with input indices, it can automatically design digital filters with such key parameters as ladder, transfer function, zero and polar coordinates, oscillation response curve and phase response curve. Types include elliptic filters, Butterworth filter, Chebyshev filter, anti-Chebyshev filter with such options as low pass, high pass, band pass, and band impedance.

--The Electronics Institute of Hubeiprovince has developed an HD2-1 automatic measurement control device for the Wuhan Petrochemical Plant. The system uses a Z80 single board computer for processing linear transformation signals of linear volume flow and density, thus measuring and controlling pipeline oil. A six digit indicator on the single board computer can display the dynamic accumulative weight values of the oil in transport, and a miniprinter can printout the data: one kind of data is used for analyzing the efficiency of the operators and the condition of the equipment; another kind of accumulated weight data is used for accounting basis.

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COMPUTER MEDICAL STATISTICAL DATA MANAGEMENT SYSTEM

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 10

[Article: "Computer Medical Statistical Data Management System"]

[Text] With the help of Beijing New Technology Research Institute, Beijing Jishuitan Hospital has successfully materialized the computerization of medical statistical work, thus making an encouraging step toward computer-aided hospital management. Now, the statisticians merely have to punch all the information into the computer from the keyboard, e.g., data from 24 wards, 16 outpatient rooms, emergency rooms for injuries and burns, and comprehensive clinic routines, as well as the first page of information from the records of discharged patients. The computer takes care of storing, collating, analyzing, retrieving and statistical computing. It can print out 40-odd kinds of reports in Chinese language for the use of medical workers and supervisors at all levels. Clinical research, training and hospital management particularly benefit from the computer which can retrieve and manage data gathered from patient records with speed and accuracy unmatched by manual method.

The system is built around a Wang VS-80 mainframe. Developed in COBOL language, the entire application software is modular structured. The system makes full use of VS-80 COBOL's unique workstation files; it can communicate with the user through "menu" which serves as a guide through system operations, and program branching is fast, convenient and visual. The machine issues warning signals in the event of keyboard error, and gives the user another chance to choose the required function key for a given task on the "menu." The main "menu" is displayed in Chinese language, and the software is very easy to use, even for users who have no previous knowledge of computers. Thus, the system can be extensively used by medical workers.

According to preliminary statistics, ever since the computer came into use, the hospital has cut down routine statistical work time by 6-7 times, thus enabling medical statisticians to concentrate more on the analysis of statistical data. Besides, it is reported that the hospital intends to transplant all kinds of management and computer-aided diagnostic programs from other hospitals to their own VS-80 machine so as to fully utilize the machine's resources.

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SYMPOSIUM ON CHINESE CHARACTER PROCESSING SYSTEMS REVIEWED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 13

[Article by Chen Shu [7115 6615]: "Symposium on Chinese Character Processing Systems Reviewed"]

[Text] A nationwide symposium on Chinese character information processing systems was convened from 12 to 19 September in Chengde. The symposium was jointly sponsored by the China Chinese Language Information Research Society and China Instruments and Meters Society; 164 representatives from 17 provinces, cities and autonomous regions throughout the country came to participate in the meeting.

It was a memorable occasion for the participants who exchanged experiences on their work and achievements accomplished over the past year in developing Chinese language processing systems. A total of 155 papers were submitted, 118 of which were selected for presentation after preliminary and final reviews. The exchange papers originated from 15 provinces and cities with improvements both in quality and quantity. The contents of the papers were rich and diversified, and contained new ideas on system designs. Some papers discussed about enhancing currently available computer systems with capabilities to process large volumes of information in Chinese characters; some looked into the problem of developing high level programming languages in Chinese, and discussed about current research efforts and preliminary results in experimental work; some presented original ideas on Chinese character type bases and packing techniques in line with the current conditions and special needs of this country; some described examples of applications of Chinese character information systems. Some papers also dealt with topics related to Chinese character information processing systems, such as the development of equipment which could use pattern recognition as means of input, laser printing as output device. As everyone had participated in actual work, the discussions at the meeting were fairly substantive. The entire meeting was a combination of small-scale discussions, large-scale discussions and special-topic discussions. The academic exchanges were carried out in a lively atmosphere throughout the entire period of the conference, and excellent results were achieved.

On the basis of the discussions, the participants summed up the developments and achievements over the past few years. In the beginning, the development of Chinese character information processing in our country mainly focused on Chinese character coding schemes. Now, the focus has gradually shifted toward development of complete Chinese information processing systems including hardware and software. Moreover, systems of practical value have begun to emerge, which is an encouraging change. The time has come to gradually build China's own Chinese information processing systems. Everyone unanimously agreed that it was a necessary step to take, and that the conditions were ripe.

One of the problems encountered in popularizing computer systems in China populated by 1 billion people lies in the effort to retain thousands of years of cultural traditions while striving at the same time to develop easy-to-use computer systems with such vital capabilities as inputting, outputting and processing Chinese characters and Chinese language documents. Once this problem is solved, it will be possible to use computers even more extensively; thus, such an undertaking is of immense importance and practical value, and its successful outcome will enable computers to play a conducive role in China's modernization construction program. It is also an urgent task for every scientific and technical worker engaged in the development of Chinese character systems. Over the past year, our nation has achieved great results in Chinese character typesetting, Chinese character information retrieval, Chinese character telecommunication, as well as basic research on Chinese character coding and information processing. Today, our country has successfully developed or renovated dozens of Chinese information processing systems and applications for numerous fields. Thus, the next logical step is to design and develop China's own series of Chinese character processing systems.

The following suggestions with regard to future developmental direction were proposed and discussed at the meeting:

1. The participants at the meeting suggested to use the results of previous research on coding schemes as the basis for the current system. The capabilities of the coding schemes will get a chance to be proven when systems and applications are developed. The trend for future growth lies in the development of comprehensive coding schemes which will undergo the gradual process of selecting the best ones (there will certainly be more than one scheme). The exchange codes should be unified, although different kinds of coding schemes for inputting can be developed. The systems should adapt to various kinds of coding systems.

The current efforts to add Chinese character processing capabilities to imported micros has helped to promote developments in this field. But we cannot rely on importation in the long run. Emphasis should be placed on designing our own Chinese information processing systems. It is necessary to establish standards (character fonts, interface, communication protocols, display formats, etc.), unify the designing of modules (such as memory), and decide on a series of Chinese character processing systems to be developed and produced in this country.

2. Chinese information processing systems should have the following capabilities: screen editing, interactive dialog in Chinese characters, storage retrieval, terminal time-sharing in medium and small frame machines, data communication, as well as programming in high-level languages, offline functions, and online functions.

It is possible to develop Chinese character type bases in compressed software packages for economical purpose and less stringent applications. But the processing speed is slow and the character fonts are poor. Under current conditions, 15 x 16 and 22 x 24 character base dot matrices are quite suitable for 7-pin wire printers, and they are still of value now. Another fairly good and economical method is to store 7,000 or 10,000 characters on a floppy disk, and load 4,000 characters into the RAM after the machine is turned on. As portable systems employed in field operations use only a limited number of disks and tapes, or none at all, EPROMS or ROMS can be used for Chinese character type bases.

3. Chinese character information processing systems should be equipped with high-level programming languages which can handle Chinese characters. The best course now to take is to make as little changes as possible to the original computer systems, and make only minimal modifications in their operating systems and the interpreter or compiler systems of their high level languages.

The question of whether or not to develop Chinese character programming languages is open to discussion and merits experimental tests as required.

Compatibility with international standards is another important point of consideration when developing Chinese language computer systems, i.e., the systems should incorporate such characteristics as interchangeability, expandability, and portability.

4. The ultimate aim of developing computer systems is to use them in applications. This is true of Chinese information processing systems since they are also computers. At the meeting, everyone joined in the discussion on the definition, understanding and standards of Chinese language data bases, and agreed that it was imperative to comply with the needs of the broadest range of users, and incorporate user-friendly techniques.

The academic symposium was most rewarding and successful. It also helped to promote ties among organizations and reorganization of learned societies. It was decided at the meeting that the two societies would establish a joint group for organizing academic activities in Chinese character information processing systems, and that all nationwide academic activities will be jointly sponsored. The two societies also jointly organized an "Editing and Publishing Group for Papers Selected From National Symposiums on Chinese Character Information Processing Systems." After each session, the group will review and edit papers which have been chosen through final reviews at the meetings.

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ASSOCIATIVE CHINESE CHARACTER PROCESSOR

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 13

[Article by Zhu Naigang [4555 6621 0474]: "Associative Chinese Character Processor"]

[Text] The associative Chinese character processor was designed and assembled by the Computing Technology Institute of the Chinese Academy of Sciences. Since 1981 when it was initially developed, the system has been constantly perfected, and it can now be configured with many different kinds of peripherals and management software. It is quite easy to perform Chinese character I/O, communication and Chinese character information processing on the system which can be used as a standalone office minisystem for processing Chinese character information; it can also be linked to a large frame computer and used as a Chinese character terminal.

The associative Chinese character processor is built on an M6800MPU mainframe with 256 KB dynamic MOS memory expandable to 480 KB. Its main peripherals are: Chinese character display unit, Chinese character printer, floppy diskette drive, cassette tape drive, and paper tape reader. It also has an RS232 standard communication interface for communicating with other systems. Its EPROM writer can be used for programming such EPROM's as 2708 and 2716, etc. A keyboard or light pen can be used for inputting Chinese characters and commands; both kinds of input devices can be used simultaneously and can be easily adapted to all kinds of operating needs.

The machine has 4,000 basic Chinese characters and 128 ASCII characters with 16 x 24 dot matrix character format. The character sets are stored in floppy disks and can be booted into the memory when the system power is turned on. This way, it is very easy to update or modify the character set library. Besides, when the machine is not being used for Chinese character information processing, a large portion of its memory space can be liberated for general computation. It takes approximately 10 seconds for the entire character set library to be loaded from the floppy diskette into the memory.

The associative processor includes the following software: monitor program, Chinese character display program, command analysis program, Chinese character input program, file editing program, print control program, communication control program, floppy diskette management program. The file editor is equipped with 20 functions, and it is quite easy to search-read, modify, edit or access Chinese characters. The design of the entire command system is rational, visual, user-friendly, and excellent for interactive work, i.e., it can converse with the operator with prompts and responses. Operators generally do not have to memorize a lot of rules, and can master the system in no time.

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6502 SINGLE BOARD CHINESE CHARACTER SMART TERMINAL

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 20, 20 Oct 82 p 16

[Article by Liang Xiyun [2733 2569 0061], Yu Fengyuan [0060 6646 3293] and Zhang Linxiang [1728 3829 5046]: "Single Board General-Purpose Chinese Character Intelligent Terminal"]

[Text] The invention of microprocessors has made it possible to provide all trades and professions with powerful yet inexpensive means of processing information, thus opening a new era for information processing. The development of Chinese language word processing in microcomputers comes as a matter of course. Today, there are quite a few reports about achievements in Chinese language word processing systems centered around microcomputers. Such systems are generally built on complete microcomputer systems configured with complete operating systems and peripherals, such as floppy disks, etc., and are fairly ideal for Chinese word processing. But the systems are fairly expensive to produce (including hardware and firmware) and highly priced as well. Moreover, due to the standards involved in the original design, remodelling is somewhat limited, and it is very difficult to establish compatibility with other computers.

We would like to introduce a general-use Chinese character intelligent terminal based on a 6502 single board processor (KIM-1). This method is applicable to all kinds of single board processors so as long as the processors are equipped with (1) parallel I/O interface; (2) magnetic tape read/write capability; (3) standard communication serial interface. Our universal protocol requires the use of terminal standard communication interface (RC-232C) and dual ASCII codes for receiving and sending national standardized codes for Chinese character information. Besides Chinese character keyboard input, visual display and print out capabilities, intelligent terminals are required to have a certain amount of Chinese character file editing capability.

Instead of employing the character generator method for outputting and processing Chinese characters, we decided to use medium resolution picture display units for outputting Chinese characters on the screen. A K-1008 display memory board produced by the American MTU company is used as display control; a renovated SONY b/w television set is used for terminal

screen output. The K-1008 display memory board is an 8 K dynamic memory. Unlike other types of memory boards, the K-1008 can utilize refresh-period read-out data by converting the data via shift registers and modulation circuits into combined video frequency signals which can be directly displayed on the monitor screen. Through this kind of conversion, approximately 8 K of memory can be directly projected on the monitor screen in a display area of 320 x 200 dots. Each byte is displayed in the form of 8 horizontal dots; each dot represents a binary digit. A Chinese character requires a minimum of 12 x 14 dot matrix, and is displayed on the screen with 12 pairs of parallel bytes (including spaces between characters). To display a character form, the right combination of character form codes are stored in a designated area of the display memory.

A Nippon Seiko GP-80M printer is configured into the system for hardcopy output; as the printer has graphic capability, no modifications are required at all. Chinese character information is passed on to the printer via the parallel interface of the microcomputer. As characters are printed by putting together their upper and lower halves, each row of character halves has to be arranged before a whole line of complete characters is printed out.

Most Chinese characters are pictophonetic. Thus, for Chinese character input, the system employs an ZC-8001A octet input device designed by Zhang Lixiang [1728 3829 5046] and manufactured by the Computer Keyboard Plant. Octet units can form a total of 256 codes which includes ASCII 7-bit codes. Thus, the Chinese character keyboard includes both the keys of the international standard English language keyboard and all function keys, and can be used as standard English keyboard whenever needed.

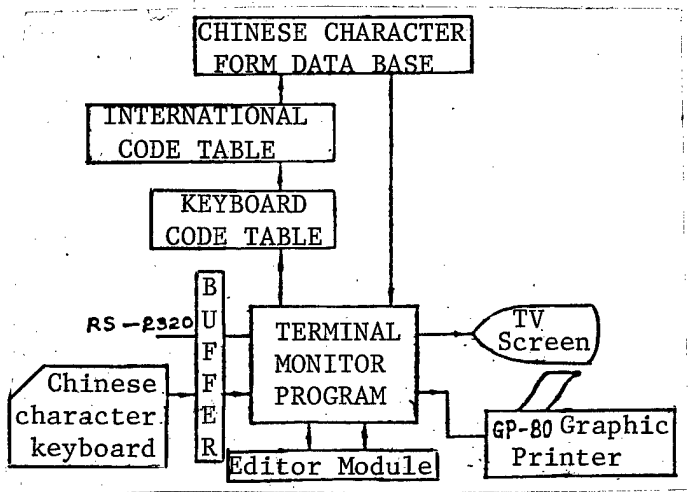
The ZC-8001A Chinese character input keyboard is suitable for many kinds of combined coding methods. The input format we are currently using is based primarily on the Chinese language Pinyin romanization system, i.e., long alphanumeric codes combining Pinyin with numeric codes representing the differences in character forms to differentiate pictophonetic characters which have the same phonetic sound but different meanings. At least one keystroke (vowel syllable) is required to punch in one Chinese character; the highest number of keystrokes is four (first letter, last letter, consonant and vowel). When typing in articles, the average number of keystrokes per character ranges approximately from 2.7 to 3. As our studies show that vowels can also serve as space endings, the space bar is not required in this type of input method; the input speed is relatively high, and code redundancy is fairly low (4,000 commonly used words with only approximately 1 percent of code redundancy). Moreover, as Pinyin romanization is used in the phonetic portion, and the four corner numerical code system is used in the character form portion, it is possible to master the input system with minimal amount of training time. The system also allows the operator to converse with the computer via the keyboard.

The functions and structure of the Chinese character terminal is shown in the diagram. At the core of the terminal is the monitor program which monitors the keyboard, analyzes the input commands, and dispatches

functional instructions. If a command from the keyboard is determined by the monitor program to be a screen control command, the control will be passed on to the screen editor; if it is determined to be a character, the external code will be memorized, and when all the external codes (1 to 4 codes) of a given character are punched in, the program will perform a two-level search according to the keyboard codes, i.e., after searching for corresponding national standard codes and storing them in the text buffer region, it will retrieve character form codes from a character data base, process the codes, and pass them on to the display memory.

The RS-232C standard, serial interface, and national standard Chinese character codes will be used for communication between the terminal and computer. We believe this will allow the terminal to adapt to different types of computers. The host computer does not require any hardware modification in order to use the terminal for displaying, printing or editing files in Chinese characters; all it needs is a supervisor to control the editing and I/O of Chinese character documents typed in national standard codes. Our system uses a two-level retrieval scheme: first, retrieval of international codes, second, retrieval of character codes. The purpose is to standardize the character data base--to correspond with the international codes only. If the user wants to use other keyboards or has a better way of inputting Chinese characters, all he has to do is to replace the keyboard-international codes comparison table (EPROM) with a new keyboard or input method, and make sure that the terminal can adapt to the user's requirements and newest Chinese character inputting technique.

The terminal has a text buffer which can accommodate 3,200 Chinese characters; the user can use function keys to perform file editing tasks on the screen. A recorder tape can be used for storing Chinese character files or records. It can be used as a standalone system for processing small volumes of Chinese character information. Large volumes of information should be handled as described earlier by linking the terminal to a larger computer via standard serial interface for interactive communication, and thus fully utilize the latter's file management system and external storage device for managing Chinese language information.



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